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Podontia affinis (Gröndal) a Polytypic Species

(Coleoptera, Chrysomelidae, Alticinae)

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Abstract

A new subspecies, *Podontia affinis indosinensis*, is described, which is distributed from India to SW-China. *Podontia affinis affinis* (Gröndal), author's subspecies, occurs in Java. The aspects of pronotum and elytra for both subspecies are figured. Morphological characters and subspecific rank of the new taxon are discussed. Specimens from the Himalayan region of Uttar Pradesh (Dehra Dun) are supposed to belong to a distinct subspecies. A pronotum of a representative of these is figured. Explanation of their isolation requires a better knowledge of their distribution before they are recognized as a distinct subspecies. Phylogenetic aspects for *Podontia affinis* are given.

Introduction

Gröndal (1817) described *Galleruca affinis* from Java and made such an exact figure of this beetle on a colored copperengraving, that it is easily possible, without having to see the type, to recognize the differences that seperate it from those from the mainland. In 1824, Dalman erected the genus *Podontia* and correctly added *Galleruca affinis* to it. In 1826 Sturm described *Podontia impressicollis*, which also is found in Java and synonymized it in 1843. Later on *Podontia affinis* also was recorded from India, Burma, Laos, N-Vietnam (Tonkin), and SW China (Kweichow).

The distribution of this species practically coincides with that for the entire genus. Seven species of *Podontia* are known, but one species from Mysol should be confined.

Specimens of *Podontia affinis* from Java proved to be different in many details from those from the mainland. Isolation in Java was long enough to give *Podontia affinis* at least the rank of subspecies. In the days of "typological taxonomy" differences which separate the two subspecies certainly would have been enough to rank them as species. However one shouldn't overlook the many characters they have in common. Another argument for interpreting them as subspecies is the variation in the shape of the pronotum. Even though there are distinct differences between subspecies in the lateral margins of the pronotum, there still is variation in these characters in the subspecies *P. affinis indosinensis*. Specimens from the

Western Himalayas show a pronotum similiar to those from Java. As long as we really don't know, if they successfully interbreed, subspecific rank much more readily, explains their phylogeny, zoogeography, and evolution. Nevertheless if it should prove to be a seperate species — which I don't believe — it still is most closely related to *P. affinis affinis*. To explain this as subspecies in the process of becoming a species will provide much more insight into the phylogeny of this generic complex than simply to split them as seperate species. We can see in the closely related genus *Blepharida*, which contains many polytypic species, what a disaster was created when morphological and color characters especially were interpreted too high. It should be our duty in systematics also to see similarities and not just differences.

Podontia affinis indosinensis nov. subspec.

Length: ♂♂ including head 8,7—12,6 mm, av. 10,5 mm, holotype 11,0 mm
less head 8,6—12,2 mm, av. 10,2 mm, holotype 10,5 mm
♀♀ including head 9,2—11,3 mm, av. 10,1 mm, allotype 10,3 mm
less head 8,6—10,8 mm, av. 9,9 mm, allotype 10,1 mm

Width: ♂♂ 5,0—6,1 mm, av. 5,3 mm, holotype 5,9 mm
♀♀ 5,0—6,4 mm, av. 5,9 mm, allotype 5,8 mm

Females are broader and males somewhat longer, which apparently is unusual for the subfamily.

Head, pronotum, legs, and antennae reddish brown. Elytra yellow with a black pattern (fig. 1 b). Mandibles yellow with a black tip.

Head is 2,5 mm broad, one transverse width of eye is 0,48 and the distance

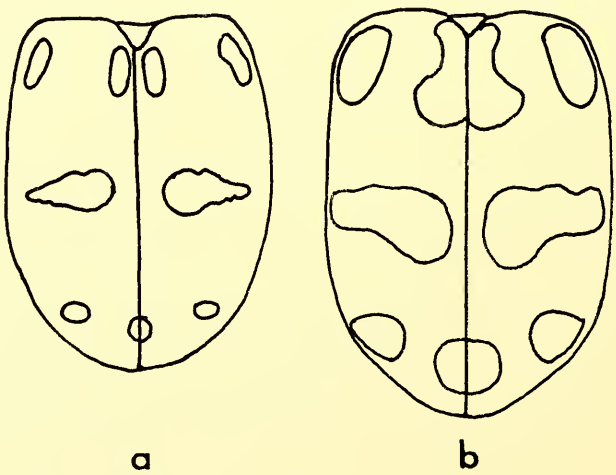

Fig. 1: Color pattern of elytra: a *Podontia affinis affinis* (Gröndal), b *P. affinis indosinensis* nov. subsp.

between the eyes 1,60 mm. The lines on the head are deeply impressed and as usual for the genus. There is a longitudinal depression on the middle of the frons.

Antennae extend to the first black marks on the elytra. The first four antennites are smooth, the rest hairy. The relative lengths of the antennal segments are as 19:7:9:10:10:9:9:9:9:9:13,5.

The width of the pronotum shows some variation from 4,0 to 4,65 mm (holotype 4,50 mm, ♀♀ 3,9—4,36 mm), the length from 2,33—2,58 mm (holotype 2,58, ♀♀ 2,08—2,44 mm). The impressions are deep, as shown in fig 2 a.

The elytra have a typical pattern (fig. 1 b). The scutellar spot is as long as the short row of scutellar punctures and surrounds nearly the reddish brown scutellum.

V a r i a t i o n : The longitudinal groove on the middle of the frons is somewhat subject of variation. There is a distinct tendency towards diminishing of this groove in specimens from Dehra Dun. The impressed lines on the head are quite variable.

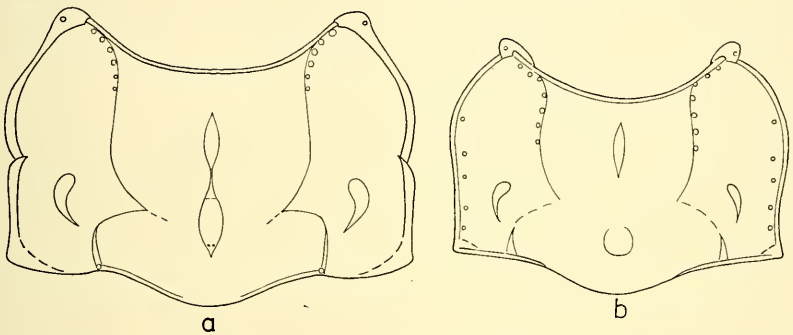

Fig. 2: Pronotum of a *Podontia affinis indosinensis* nov. subsp., b *P. affinis affinis* (Gröndal)

Pronotum: Not all specimens have the side margins constricted to the extreme as figured for the holotype (fig. 2 a). Nevertheless a constriction is evident in all specimens, except those from the Kumaon Himalaya (fig. 3), which Liesenfeldt collected in Dehra Dun while he was there in the internment camp from 1940 to 1945. More specimens are necessary to determine if this variation also indicates subspecific rank. I have only 16 specimens and no records from the east until Darjeeling, where all specimens are again typical *P. affinis indosinensis*. The Dehra Dun specimens do seem to be from different places around Dehra Dun; for one example has an extra label, "Siwalik Hills".

Only a few specimens have connecting grooves extending from the longitudinal grooves on the base of the pronotum to the ones leading down from the front angles. Likewise, a groove does not always extend from the sidemarginal constriction forward to the line behind the front angles as seen in fig. 2 a. There is much variation in punctuation within the grooves varying from quite strong to being nearly absent. The Dehra Dun specimens have more punctures in the mentioned grooves from the side margins to the ones leading from the front angles.

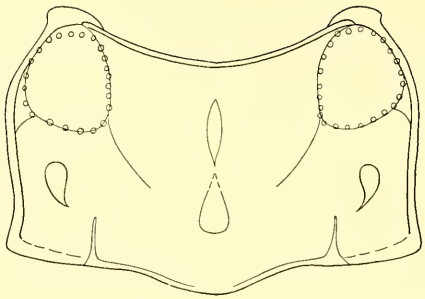

Fig. 3: Pronotum from the Dehra Dun specimens of *Podontia affinis*

Elytra: There is one specimen from Hoa Binh (Tonkin), having the apical half of the elytra black and with a yellow spot near the apical end. Along the suture the black color connects with the scutellar spot. In one specimen from Laos, the broad black mark on the middle is faded.

Material: I have seen 219 specimens.

Type material: (N-Vietnam) Tonkin: Hoa Binh 4♂♂, 6♀♀ leg. A. Cooman (Mus. Frey). — Laos: Umgebung Vanky, 1963 3♂♂ (holotype), 3♀♀ (allotype). Umgebung Vientiane, III.—VI. 1963, 3♂♂, 6♀♀. — Umgebung Paklay, 1963 1♀. — Umgebung Paksé 1♂ (Zool. Staatssammlung München). — Süd Laos: Paksé 4♂♂, 4♀♀ leg. Ardoin (Mus. Frey). — Malaya: Perak, 1901 1♂, 1♀ leg. Fruhstorfer (Zool. Staatssammlung München). — India: West Bengal, Darjeeling 3♂♂, 1♀ (Mus. Frey).

Known Distribution: SW China (Kweichow), N Vietnam (Tonkin), Laos, Burma, Malaya, Assam, W Bengal (Darjeeling), Sikkim, Uttar Pradesh (Dehra Dun) seems to be a distinct subspecies.

Localities from *Podontia affinis affinis* (Gröndal):

Java: Buitenzorg, V. 1920 1♀, J. B. Corporal. — Mts Kawie, Pasoeroean, 1♂, 1♀. — Malang 4♂♂, 1♀ leg. Götzelmann. — Preanger 5♂♂, 4♀♀ (Mus. Frey). — Sulpiz 10♂♂, 4♀♀ leg. Kurz (Zool. Staatssammlung München).

Sumatra: Pajakombe 1♀ leg. Götzelmann (Mus. Frey).

Discussion

When both *P. affinis affinis* and *P. affinis indosinensis* are placed side by side one gets the impression that *P. affinis indosinensis* is larger. Exact measurements however, deny this. One reason for this impression could be the more intensive coloration of *P. affinis indosinensis*. I have only 33 specimens of *P. affinis affinis*, but they seem to be more stable in size than *P. affinis indosinensis*, which shows much more variation and consequently gives the impression that they are larger, or at least that the pronotum is larger.

The transverse width of one eye compared to the interocular width is the same in both subspecies. The interocular distance and the eyes are somewhat larger in *P. affinis indosinensis*, as are the grooves on the head stronger and rougher.

The pronotum is different (fig. 2 a and 2 b). The side margins are constricted — even interrupted in the extreme — in *P. affinis indosinensis.* Also, the base is distinctly interrupted in *P. affinis indosinensis* by the longitudinal groove on each side of the middle, but not so in *P. affinis affinis.* In this subspecies the longitudinal grooves on the middle of the pronotum are not connected by impressed lines with the more roundish grooves nearer the base, as in *P. affinis indosinensis* where it is more longitudinal.

The only distinct difference in the aedeagus is size. The length of this organ in *P. affinis affinis* is 3,8—4,1 mm; the one of *P. affinis indosinensis* is 4,2—4,5 mm long. Chitinized parts around the ostium at the dorsum near the apex appear different in several specimens of the subspecies *P. affinis affinis* (narrower and somewhat pointed), but in the same series also are specimens with the same sculpture (broader and rounded, somewhat spoonlike at its apices) as in *P. affinis indosinensis.*

The reduced black marks on the elytra (fig. 1 a and 1 b) separates *P. affinis affinis* from *P. affinis indosinensis.*

Geographic isolation of *P. affinis affinis* in Java and Sumatra from *P. affinis indosinensis* on the mainland indicates the subspecific rank.

Phylogenetic Aspects of *Podontia affinis*

Large populations as demonstrated here with *Podontia affinis indosinensis* always have been (Scherer, 1973) my special field of interest. They are almost neglected in evolutionary research. Much more work has been done on small panmictic populations, in which by better gene flow evolution can advance so rapidly. This is obvious and easily understandable. From a large population, a smaller peripheral population becomes isolated, by reason of its smaller size the gene exchange is easier practicable, its evolution more rapid, isolating mechanisms are established, so to speak they are faster in their evolution than the original larger gene pool. But this doesn't explain, why these "superpopulations" in the course of the time can overtake those smaller new genetic entities in their evolution. The small panmictic unity has opened up a new ecological niche. Its panmictic habit maintains balance and stability, once the species has reached an adaptive equilibrium with its environment. Within the smaller population of *Podontia affinis affinis* on the island of Java, we are certainly missing the evolutionary stimulating peripheral populations, additionally the storage capacity will be smaller for generic variation. A "superpopulation" like *P. affinis indosinensis* has certainly not a comparable panmictic gene flow within the same unit of time as a smaller population, but it has genetic changes within local populations, which together with the genetic contents of immigrants from other neighbouring somewhat genetically different demes accelerate genetic innovations in such local populations of the "superpopulation". They also have gene flow to other local populations, and ad infinitum. Of special interest are those "subpopulations" found near the periphery of a "superpopulation". These populations are exposed to different ecological pressures and temporary isolation from the main gene pool. Such peripheral populations certainly enhance genetic accquisition. Also ecologically seen, those "superpopulations" will be more successful than smaller ones,

so to speak their niche is larger, their adaptive peak is higher. Supposing, as often happens in Alticinae, that a species is monophagous, feeding only on one plant. A peripheral population gets temporarily isolated and is forced to feed on a related species of its former host. Genetically fixed it can be a genetic novelty, when integrated to the main gene pool. The main gene pool will be additionally supplied from its periphery but also from so many demes by pretested genes and gene combinations. This will certainly be a profit for these large populations. One could call these populous widespread populations a "genetic shake-up" and a successful genotype is undeniable.

Evidence of a large contribution in evolution by these "superpopulations" show the many genera, common to Nearctic and Eurasia, within the Alticinae about 40 %. That distribution of these genera has happened across the Bering Strate, possible only during a moderate climate, as existed in those latitudes in Tertiary, indicated by the common genera, which are distributed on the Eurasian part only along the Pacific Coast, and unknown to Europe itself. That these nowadays genera have been such "superpopulations" during those times will be obvious. One can certainly speak of the considerable value of those "superpopulations" in evolution.

Podontia affinis affinis in Java shows with its morphological uniformity a smaller panmictic population, the same as the population from Dehra Dun. But certainly the very variable main gene pool of *Podontia affinis indosinensis,* extending from Darjeeling to China, will be the more progressive element. Genetic variability contains more preadaptive elements than stable units.

Literature Cited

Dalman J. W. 1824: Ephemerides Entomologicae, Holmie, 1—36

Gressitt, J. L. and Kimoto, S. 1963: The Chrysomelidae (Coleopt.) of China and Korea. — Pacific Insects Monograph 1A, 1B: 1—1026

Gröndal in Schönherr, C. J. 1817: Synonymia Insectorum, 1 (2): 289, T 4, f. 9, Upsala Upsala

Maulik, S. 1926: The Fauna of British India. Coleoptera, Chrysomelidae (Chrysomelinae and Halticinae). London, I—XIV: 1—442

Scherer, G. 1969: Die Alticinae des Indischen Subkontinents (Coleoptera-Chrysomelidae). — Pacific Insects Monograph 22: 1—251

— — 1973: Ecological and Historic-Zoogeographic Influences on Concepts of the Genus as Demonstrated in Certain Chrysomelidae (Coleoptera). — Zoologica Scripta, 2: 171—177

Sturm, J. 1826: Catalog meiner Insecten-Sammlung. Nürnberg, 1—207

— — 1843: Catalog der Kaefer-Sammlung. Nürnberg, I—XII: 1—386, 6 T

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